

CRS Report for Congress

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Navy DD(X) Destroyer Program: Background and Issues for Congress

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Summary

The DD(X) is a proposed new type of Navy destroyer. The Navy estimates that the first DD(X) will cost about \$2.8 billion to design and build, including about \$1 billion in detailed design and nonrecurring engineering costs for the class. The issue for Congress is whether to approve, modify, or reject the Navy's plan for the DD(X) program. For a longer discussion of the DD(X), see CRS Report RL32109.¹ This report will be updated as events warrant.

Background

The DD(X) destroyer program was announced by the Navy in November 2001 as part of a proposed new family of surface combatants that is also to include the small the Littoral Combat Ship (LCS) and a future cruiser called the CG(X).² The DD(X) replaced an earlier destroyer called the DD-21. The DD(X), like the DD-21, is to be a multimission destroyer with an emphasis on the land-attack mission. Each DD(X) is to be equipped with two 155-mm (6.1-inch) Advanced Gun Systems (AGSs) for supporting Marines ashore, not less than 600 shells for those guns, and 80 missile tubes for Tomahawk cruise missiles and other weapons. The DD(X) is to have a crew of 125 to 175 persons, compared to more than 300 on current Navy destroyers and cruisers. In large part due to its reduced crew size, the DD(X) is to cost substantially less to operate and support than the Navy's current cruisers and destroyers.

The Navy earlier indicated it was planning to procure 24 DD(X)s through FY2017 before shifting to procurement of CG(X)s in FY2018. Recently, however, the Navy indicated it may accelerate the start of CG(X) procurement to FY2011 and procure no more than 9 DD(X)s. The FY2005-FY2009 Future Years Defense Plan (FYDP) calls for

¹ CRS Report RL32109, *Navy DD(X) and LCS Ship Acquisition Programs: Oversight Issues and Options for Congress*, by Ronald O'Rourke.

² For more on the LCS and CG(X), see CRS Report RL32109, op cit, and CRS Report RS21305, *Navy Littoral Combat Ship (LCS) Program: Background and Issues for Congress*, by Ronald O'Rourke.

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procuring the first DD(X) in FY2005, another two in FY2007, two more in FY2008, and three more in FY2009.

The Navy estimates that the first DD(X) will cost about \$2.8 billion to design and build, including about \$1.8 billion in hands-on construction costs for the ship and about \$1 billion in detailed design and nonrecurring engineering costs (DD/NRE) for the class. The Navy proposed funding the first DD(X) through the Navy's research and development account rather than the Navy's ship-procurement account (known formally as the Shipbuilding and Conversion, Navy, or SCN, account), where Navy combat ships traditionally have been procured, and have it enter service in FY2011. The Navy estimates that the fifth and sixth DD(X)s will have an average unit procurement cost of \$1.2 billion to \$1.4 billion in FY2002 dollars. The Congressional Budget Office (CBO) estimates that a class of 24 DD(X)s built at a rate of 2 per year would have an average unit procurement cost of \$1.8 billion in FY2003 dollars. As shown in the table below, the Navy's estimated procurement cost equates to a cost per thousand tons (CPTT) of light-ship displacement (i.e., the empty weight of the ship without fuel) that is 36% to 45% less than that of today's DDG-51 destroyers, while CBO's estimate equates to a CPTT that is 18% less. If the DD(X) CPTT is set equal to that of the DDG-51, the DD(X) would cost more than \$2 billion.

Table 1. Cost Per Thousand Tons (CPTT)

| Ship | Cost (when procured at 2 per year) | Full load displacement (tons) | Light-ship displacement (tons) | CPTT | DD(X) CPTT compared to DDG-51 |
|----------------------------|------------------------------------|-------------------------------|--------------------------------|---------------|-------------------------------|
| DDG-51 | \$1.25 bil. | ~9,000 | 6,950 | ~\$180 mil. | — |
| Estimates for DD(X) | | | | | |
| Navy | \$1.2-1.4 bil. | ~14,000 | 12,135 | \$99-115 mil. | -36% to -45% |
| CBO | \$1.8 bil. | ~14,000 | 12,135 | \$148 mil. | -18% |
| CPTT = DDG-51 | \$2.18 bil. | ~14,000 | 12,135 | \$180 mil. | equal |

Two industry teams competed for the right to become the lead preliminary design agent for the DD(X) — **the “Blue” team**, which included General Dynamics’ Bath Iron Works (GD/BIW) as the shipbuilder, Lockheed Martin as the combat system designer and integrator, and other companies; and **the “Gold” team**, which included Northrop Grumman’s Ship Systems (NGSS) division as the shipbuilder, Raytheon Systems Company as the combat system integrator, and other companies. On April 29, 2002, the Navy announced it had selected the Gold team. The Gold team was subsequently expanded into a **DD(X) “national” team** that also includes BIW, Lockheed Martin, and Boeing. The Navy originally anticipated holding another competition for the next phase in the program, which includes completing the ship’s design and building the first ship. On March 3, 2004, however, the Navy stated that, to avoid delaying the program, it had decided to award the contract for the next phase on a sole-source basis to NGSS. The Navy has also stated that the ship construction contracts will be allocated equally between NGSS and BIW for the first six ships.

Table 2. Funding For DD(X) Program, FY2002-FY2009
 (millions of then-year dollars)

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | Total thru FY2009 |
|---|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| Research, Development, Test & Evaluation, Navy (RDTEN) account | | | | | | | | | |
| Ship 1 construction | — | — | — | 103 | 288 | 294 | 353 | 269 | 1307* |
| DD/NRE | — | — | — | 118 | 349 | 252 | 127 | 87 | 933* |
| All other** | 490 | 895 | 1059 | 1230 | 1097 | 791 | 439 | 259 | 6260* |
| Total RDTEN*** | 490 | 895 | 1059 | 1451 | 1734 | 1337 | 919 | 615 | 8500* |
| Shipbuilding and Conversion, Navy (SCN) account | | | | | | | | | |
| Ship 2 | — | — | — | — | 49 | 2004 | — | — | 2053 |
| Ship 3 | — | — | — | — | 49 | 1493 | — | — | 1542 |
| Ship 4 | — | — | — | — | — | 49 | 1729 | — | 1778 |
| Ship 5 | — | — | — | — | — | 49 | 1494 | — | 1543 |
| Ship 6 | — | — | — | — | — | — | 49 | 1695 | 1744 |
| Ship 7 | — | — | — | — | — | — | 49 | 1478 | 1527 |
| Ship 8 | — | — | — | — | — | — | — | 1523 | 1523 |
| Total SCN | 0 | 0 | 0 | 0 | 98 | 3595 | 3321 | 4696 | 11710 |
| TOTAL | 490 | 895 | 1059 | 1451 | 1832 | 4932 | 4240 | 5311 | 20210 |

Source: Navy data provided to CRS by Navy Office of Legislative Affairs, February 20, 2004.

* Additional funding required in FY2010-FY2011 to complete construction of lead ship, and in years after FY2009 for DD/NRE and all other RDT&E.

** Funding for all RDT&E for the DD(X) program other than DD/NRE.

*** Figures do not include a total of \$1,111.4 million in research and development funding provided for the DD-21/DD(X) program during the period FY1995-FY2001.

Issues for Congress

Procurement Cost and Program Affordability. One potential issue for Congress concerns the potential procurement cost of follow-on DD(X)s and the resulting affordability of the DD(X) program. Some observers are concerned about the Navy's ability to build DD(X)s at a cost of \$1.2 billion to \$1.4 billion for the following reasons:

- the Navy's estimate includes a \$200-million range of uncertainty, suggesting the Navy has an incomplete understanding of potential DD(X) costs.
- CBO's estimate (\$1.8 billion) is 29% to 50% higher than the Navy's estimate, suggesting that there are major analytical differences between the Navy and CBO regarding the potential cost of the follow-on ships;
- the Navy has not explained in detail why it believes the DD(X) will be any less expensive on a per-weight basis to build than the DDG-51; and
- the Navy has experienced substantial cost growth in other recent Navy shipbuilding programs, such as the LPD-17 amphibious ship program and the Virginia-class submarine program.

Readiness of New Technologies. Navy officials argue that they have taken steps to ensure that the several new technologies scheduled for the DD(X) would be ready for the lead DD(X), including the use of land-based engineering design models (EDMs) for verifying new technologies and increased levels of development funding. Skeptics are concerned that in spite of these steps, one or more critical technologies may not be ready for the lead DD(X). A September 2004 GAO report on the DD(X) program states:

To reduce program risk, the Navy plans to build and test 10 developmental subsystems, or engineering development models, that comprise DD(X)'s critical technologies. While using these models represents a structured and disciplined approach, the program's schedule does not provide for the engineering development models to generate sufficient knowledge before key decisions are made. None of the technologies in the 10 engineering development models was proven to be mature when system design began, as best practices advocates. Moreover, the Navy does not plan to demonstrate DD(X) technology maturity and design stability until after the decision to authorize construction of the lead ship, creating risk that cost, schedule, and performance objectives will not be met. With many of the tests to demonstrate technology maturity occurring around the time of critical design review in late fiscal year 2005, there is the risk that additional time and money will be needed to address issues discovered in testing.

Some of the technologies are progressing according to the Navy's plans, while others have experienced challenges. Four of the 10 engineering development models... are progressing as planned toward demonstrating complete subsystems. However, four other models... have encountered some problems. At this point, the most serious appear to be the schedule delay in the dual band radar resulting from the Navy's decision to change one radar type and the additional weight of the integrated power system. The two remaining engineering development models — the integrated undersea warfare system and the advanced gun system — are progressing as planned, but will not culminate in the demonstration of complete subsystems before being installed on the first ship. While the Navy has fallback technologies for the hull form and the integrated power system, it does not have such plans for the other eight engineering development models.³

Naval Surface Fire Support Mission. The size and cost of the DD(X) reflects in part the presence on the ship of the two AGSs, which in turn reflects a Navy desire to close a shortfall in naval surface fire support (NSFS) capability that was created in the early 1990s when the Navy retired its reactivated Iowa-class battleships. DD(X) supporters could argue that the requirement for additional NSFS capability has been periodically reviewed and revalidated in recent years, and that the geography of places like the Korean Peninsula, as well as the ability of Navy ships to remain on station for months at a time without interruption, are reasons for maintaining a robust Navy NSFS capability. DD(X) skeptics can argue that NSFS did not play a major role in U.S. military operations in Kosovo, Afghanistan, and Iraq, and that Afghanistan and Iraq highlighted new concepts for ground operations using smaller-sized ground units

³ U.S. Government Accountability Office, *DEFENSE ACQUISITIONS: Challenges Facing the DD(X) Destroyer Program*, GAO-04-973, Sep. 2004. See also U.S. General Accounting Office, *DEFENSE ACQUISITIONS: Assessments of Major Weapon Programs*, GAO-04-248, Mar. 2004, pp. 45-46.

supported by aircraft armed with relatively inexpensive, all-weather precision-guided munitions, raising questions about the priority of NSFS compared to other investments.

Funding Strategy for First Ship. The Navy argues that funding the lead DD(X) in the Navy's research and development account will permit the Navy to mitigate technical risk by permitting the ship's new technologies to be developed in a more R&D-like managerial environment, and encourage program managers to allocate funds to improved production technologies that will help reduce the recurring production costs of the class. Skeptics could argue the Navy's plan could permit the Navy to blend construction funding with traditional research and development funding, obscuring the construction cost of the lead ship, and also permit the Navy to fund the construction cost of the ship incrementally, rather than all at once (as normally required by the full funding policy for defense procurement),⁴ further obscuring the total construction cost of the ship. Both these things, skeptics could argue, could weaken congressional oversight of the program, which depends making total ship construction costs clear and fully visible.

Shipbuilding industrial base. Some observers, particularly those connected with the surface combatant industrial base, are concerned that the Navy's plan for transitioning from DDG-51 procurement to DD(X) procurement will not provide sufficient work for the industrial base over the next few years, and particularly in FY2006, when the FYDP provides for the procurement of no large surface combatants. Options for providing additional work for the industrial base include procuring additional DDG-51 destroyers, accelerating procurement of amphibious ships, and expanding and accelerating the procurement of new cutters under the Coast Guard's Deepwater acquisition program.⁵

Potential Options For Congress. Potential options for Congress for the DD(X) program, some of which can be combined, include the following:

- approve the DD(X) program as proposed by the Navy;
- shift procurement of the lead DD(X) to the SCN account;
- defer procurement of the lead DD(X) to FY2006 or a later year;
- procure 3 DD(X)s per year to reduce DD(X) unit procurement costs;
- procure DD(X)s at a rate of 1 or 1½ per year to reduce total annual DD(X) procurement costs, and supplement the industrial base, if needed, with additional Deepwater cutters;
- procure one or a few DD(X)s as a bridge to an accelerated CG(X), and supplement the industrial base, if needed, with additional Deepwater cutters;
- terminate the DD(X) program and instead procure (a) an entirely new low-cost NSFS ship built strictly around 2 AGSs as a focused means of providing additional NSFS capability at lower unit procurement cost, or (b) a new-design frigate designed to capture the DD(X)'s mission capabilities other than NSFS, or (c) both; and

⁴ For more on the full funding policy, see CRS Report RL31404, *Defense Procurement: Full Funding Policy — Background, Issues, and Options for Congress*, by Ronald O'Rourke.

⁵ For more on the Deepwater program, see CRS Report RS21019, *Coast Guard Deepwater Program: Background and Issues for Congress*, by Ronald O'Rourke.

- terminate the DD(X) program, procure no larger Navy surface combatant until the CG(X), and supplement the industrial base with additional Deepwater cutters.⁶

Legislative Activity For FY2005

For information on the DD(X) in the FY2005 defense authorization bill (H.R. 4200/S. 2400), see the Legislative Activity section of CRS Report RL32109. The conference report (H.Rept. 108-622 of July 20, 2004) on the FY2005 defense appropriations bill (H.R. 4613) provides \$350.5 million in advance procurement (AP) funding in the SCN account for the DD(X) program — \$221.1 million for the lead DD(X) (transferred from the Navy's research and development account), and \$84.4 million for the second DD(X). The report stated:

The conferees agree to provide a total of \$305,516,000 for advance procurement for the DD(X) class of ships instead of \$320,516,000 as proposed by the Senate and no appropriation as proposed by the House. The conferees direct the Navy to include future funding requests for the DD(X) in the Shipbuilding and Conversion, Navy appropriation. Within the funds provided, \$221,116,000 is only for design and advance procurement requirements associated with the first ship of the DD(X) class and \$84,400,000 is only for design and advance procurement requirements associated with construction of the second ship at an alternative second source shipyard. The conferees direct that no funds shall be available for the procurement of long lead time material for items that are dependent upon delivery of a DD(X) key technology unless that technology has undergone testing, thereby reducing risk to overall program costs. The conferees direct that full funding of the remaining financial requirement for these ships, not including traditional advance procurement requirements, shall be included in a future budget request. (Page 188; see also pages 185 and 187.)

The conference report also provides \$1,176.5 million in research and development funding for the DD(X) program. Accounting for the \$221.1 million transferred to the SCN account, this equates to a \$34-million reduction from the request. The report stated:

The conferees agree to provide \$1,176,469,000 for the DD(X) program instead of \$1,182,785,000 as proposed by the House and \$1,210,469,000 as proposed by the Senate. The conferees agree that prior to the completion of the Critical Design Review (CDR), the Navy should complete land-based testing of the Advanced Gun System (AGS) and the Integrated Power System (IPS). The conferees believe it is not advisable to complete CDR prior to ensuring that at least two of the 12 key technologies have completed testing due to historical trends of ship cost growth based on re-design to accommodate changes in technological requirements. The conferees direct the Navy to submit a report to the congressional defense committees that addresses the Navy's plan to transition DD(X) key technologies through development, testing, acquisition, and installation. This report should also address "back up" technologies that could be inserted into the DD(X) program should the maturity of the planned technology not materialize within a timeline necessary to meet the stated DD(X) schedule. (Page 310; see also pages 278 and 300)

⁶ For more on the option of procuring a new-design frigate, see U.S. Congressional Budget Office, *Transforming the Navy's Surface Combatant Force*, Mar. 2003, pp. 27-28, 63.